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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,037	07/10/2003	Hong-Seok Lee	277/ 011	9800
27849	7590	07/13/2007		
LEE & MORSE, P.C. 3141 FAIRVIEW PARK DRIVE SUITE 500 FALLS CHURCH, VA 22042			EXAMINER BODDIE, WILLIAM	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/616,037	Applicant(s) LEE ET AL.	
	Examiner William L. Boddie	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 10-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 10-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. In an amendment dated, April 9th, 2007, the Applicants amended claims 1, 8 and added new claims 14-20. Currently claims 1, 3-8 and 10-20 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 3-8 and 10-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the claim currently requires that the display period be between a no-light display period and a second no-light display period. However, the two no-light display periods are included in the same non-display period. Thus it appears as though the non-display period now encompasses the display period.

5. Claim 20 recites the limitation "the second no-light display period" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. It appears as though the Applicants intended for claim 20 to be dependent upon claim 19. Claim 20 will be examined under this assumption.

Claim Rejections - 35 USC § 103

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 8, 12-15 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nally et al. (US 2004/0217932) in view of Melnick et al. (US 6,348,959).

With respect to claim 1, Nally discloses, a normally black (note the voltage waveforms in fig. 7) liquid crystal display (LCD) (fig. 33), comprising:

an LCD panel having a plurality of color filters to selectively filter white light (fig. 1 ; paras. 6 and 11); and

a driver for driving the LCD panel (source and gate driver in fig. 33), wherein a frame of an image being driven by the driver includes:

a display period during which the driver drives the LCD panel to display a desired color by mixing a combination of light output by the plurality of color filters (para. 6), and

a non-display period (fixed data in fig. 7) including a white light display (white in fig. 7) period and a no-light display period (black in fig. 7) during which the driver drives the LCD panel to display white light (white in fig. 7) during the white light display period then no light (black in fig. 7) during the no-light display period at a different and distinct time period than the white light display period (para. 27, discusses the operation and advantages of this driving scheme; also note para. 14 which expressly states that such a driving scheme is applicable to color filter TFT display systems).

Nally does not expressly disclose, that the no-light display period occurs after the white light display period.

Melnick discloses, that normally white display is preferred over normally black displays (col. 1, lines 27-42).

Nally and Melnick are analogous art because they are both from the same field of endeavor namely, LCD display control schemes.

At the time of the invention it would have obvious to replace the normally black display of Nally with the normally white display of Melnick.

The motivation for doing so would have been to achieve high color purity and higher brightness (Melnick; col. 1, lines 32-34).

It should be clear that upon the changing to normally-white, the low voltage applied to the LCD will generate a white display and a high burst afterwards results in a black period. As such Nally, as modified by Melnick, discloses that the no-light period occurs after the white light display period.

With respect to claim 8, Nally discloses, a method for driving a liquid crystal display (LCD) including an LCD panel (fig. 33) having a plurality of color filters to selectively filter white light (fig. 1, paras. 6 and 11), the method comprising:

during a frame of an image to be displayed (clear from fig. 7, for example):

driving the LCD panel during a display period (color in fig 7) to display a desired color by mixing a combination of light output from the plurality of color filters (para. 6);
and

driving the LCD panel during a non-display period including a no-light display period (black in fig. 7) and a white light display period (white in fig. 7) to display white light during the white light display period and no light during the no-light display period (para. 27).

Nally does not expressly disclose, that the no-light display period occurs after the white light display period.

Melnick discloses, that normally white display is preferred over normally black displays (col. 1, lines 27-42).

Nally and Melnick are analogous art because they are both from the same field of endeavor namely, LCD display control schemes.

At the time of the invention it would have obvious to replace the normally black display of Nally with the normally white display of Melnick.

The motivation for doing so would have been to achieve high color purity and higher brightness (Melnick; col. 1, lines 32-34).

It should be clear that upon the changing to normally-white, the low voltage applied to the LCD will generate a white display and a high burst afterwards results in a black period. As such Nally, as modified by Melnick, discloses that the no-light period occurs after the white light display period.

With respect to claims 12-13, Nally and Melnick disclose, the LCD according to claims 1 and 8 (see above).

Nally further discloses, wherein the LCD panel is driven to display no light during each non-display period between each of the display periods during which the desired

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color formed by mixing a combination of light output by the plurality of color filters is displayed (seems clear from fig. 7, that the black period is inserted prior to each color display).

With respect to claim 14, Nally and Melnick disclose, the LCD as claimed in claim 1 (see above).

Nally, as modified by Melnick, further discloses, wherein during the non-display period, the driver drives the LCD panel to display no light immediately after driving the LCD panel to display white light (with the switch to a normally white display, Nally would still achieve all the benefits of the invention, the only difference being that the white period would occur prior to the black period).

With respect to claim 15, Nally and Melnick disclose, the LCD as claimed in claim 14 (see above).

Nally further discloses, wherein the display period of the frame follows the non-display period of the frame (clear from fig. 7).

With respect to claim 17, Nally and Melnick disclose, the method as claimed in claim 8 (see above).

Nally, as modified by Melnick, further discloses, wherein during the non-display period, the driver drives the LCD panel to display no light immediately after driving the LCD panel to display white light (with the switch to a normally white display, Nally would still achieve all the benefits of the invention, the only difference being that the white period would occur prior to the black period).

With respect to claim 18, Nally and Melnick disclose, the method as claimed in claim 8 (see above).

Nally further discloses, wherein the display period of the frame follows the non-display period of the frame (clear from fig. 7).

8. Claims 3-5, 7, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nally et al. (US 2004/0217932) in view of Melnick et al. (US 6,348,959) and further in view of Iwauchi (US 5,843,492).

With respect to claim 3, Nally and Melnick disclose, the LCD according to claim 1 (see above).

Neither Melnick nor Nally expressly disclose, wherein the plurality of color filters are transmissive color filters attached to an upper portion of the LCD panel.

Iwauchi discloses, a plurality of transmissive color filters (6 in fig. 1) attached to an upper portion of the LCD panel (8 in fig. 1, also note col. 13, lines 63-67 and col. 14, lines 1-12).

Melnick, Nally and Iwauchi are analogous art because they are from the same field of endeavor namely, filter TFT LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to construct the filters of Nally and Melnick as shown by Iwauchi's upper portion transmissive color filters.

The motivation for doing so would have been to achieve a brighter multi-color display (Iwauchi; col. 3, lines 65-67).

With respect to claim 4, Nally, Melnick and Iwauchi disclose, the LCD according to claim 3 (see above).

Neither Nally nor Melnick expressly disclose, a reflecting plate.

Iwauchi further discloses, a reflecting plate (16 in fig. 2a, col. 7, lines 15-17).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include a reflecting plate, taught by Iwauchi, in the LCD panel disclosed by Nally and Melnick.

The motivation for doing so would have been to lower power consumption by removing the need for a backlight to illuminate the panel.

With respect to claim 5, Nally and Melnick disclose, the LCD according to claim 1 (see above).

Neither Melnick nor Nally expressly disclose, wherein the color filters are reflective and attached to the lower portion of the LCD panel.

Iwauchi discloses, reflective color filters attached to the lower portion of the LCD panel (21(a,b,c) in fig. 6, col. 14, lines 25-28)

At the time of the invention it would have been obvious to one of ordinary skill in the art to include reflective color filters as disclosed by Iwauchi, in the LCD panel of Nally and Melnick.

The motivation for doing so would have been to remove the need for a reflecting plate in panel.

With respect to claim 7, Nally, Melnick and Iwauchi disclose, the LCD according to claim 5 (see above).

Iwauchi further discloses, wherein the plurality of color filters of the reflective color filter are made of dielectrics having different indices of refraction (While Iwauchi's embodiments use cyan, magenta, and yellow there is no reason one couldn't create the same filter using red, green, and blue. Col. 14, lines 36-45).

With respect to claim 10, as claim 10 is merely a method statement of the above limitations of claim 3, claim 10 is rejected on the same merits as shown above.

With respect to claim 11, as claim 11 is merely a method statement of the above limitations of claim 5, claim 11 is rejected on the same merits as shown above.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nally et al. (US 2004/0217932) in view of Melnick et al. (US 6,348,959) in view of Iwauchi (US 5,841,492) and further in view of Alvarez (US 5,131,736).

With respect to claim 6, Nally, Melnick and Iwauchi disclose, the LCD according to claim 5 (see above).

Neither Nally, Melnick nor Iwauchi expressly disclose wherein the plurality of color filters are made of photonic crystals, which are alternate arrays of dielectrics.

Alvarez discloses, a filter constructed of alternate arrays of dielectrics (col. 3, lines 27-45).

Nally, Melnick, Iwauchi, and Alvarez are all analogous art because they are directed to a similar problem solving area, namely filtering white light efficiently.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the dielectric array of Alvarez in place of the dielectric mirror of Iwauchi, Melnick and Nally.

The motivation for doing so would have been for the higher efficiency of the dielectric array (Alvarez, col. 1, lines 21-25).

10. Claims 16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nally et al. (US 2004/0217932) in view of Melnick et al. (US 6,348,959) and further in view of Kwon (US 6,947,034).

With respect to claim 16, Nally and Melnick disclose, the LCD as claimed in claim 15 (see above).

Neither Nally nor Melnick expressly disclose, wherein the non-display period further includes a second no-light display period during which the driver drives the LCD panel to display no light, and the display period occurs between the no-light display period and the second no-light display period.

Kwon discloses, including adjust data (black in fig. 3) at the end of each display period (1H in fig. 3) during which no-light is displayed (col. 3, lines 54-61).

Nally, Melnick and Kwon are analogous art because they are from the same field of endeavor namely, control circuitry and waveforms for LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the black adjustment data of Kwon in the display waveforms of Nally and Melnick.

The motivations for doing so would have been to offset the charging of the normal data and subsequently increase the display quality (Kwon; col. 3, lines 59-61).

To further explain, Nally's original waveform is black|white|color|hold|repeat. Upon modification by Melnick's normally white display the waveform becomes,

white|black|color|hold|repeat. Finally upon inclusion of the black adjustment data of Kwon the waveform becomes white|black|color|hold|black|repeat.

With respect to claim 19, Nally and Melnick disclose, the method as claimed in claim 8 (see above).

Neither Nally nor Melnick expressly disclose, wherein the non-display period further includes a second no-light display period during which the driver drives the LCD panel to display no light, and the display period occurs between the no-light display period and the second no-light display period.

Kwon discloses, including adjust data (black in fig. 3) at the end of each display period (1H in fig. 3) during which no light is displayed (col. 3, lines 54-61).

Nally, Melnick and Kwon are analogous art because they are from the same field of endeavor namely, control circuitry and waveforms for LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the black adjustment data of Kwon in the display waveforms of Nally and Melnick.

The motivations for doing so would have been to offset the charging of the normal data and subsequently increase the display quality (Kwon; col. 3, lines 59-61).

With respect to claim 20, Nally, Kwon and Melnick disclose, the method as claimed in claim 19 (see above).

Nally, modified by Melnick and Kwon, further discloses, wherein the LCD panel is driven such that a white light display period of a subsequent frame occurs after the second no-light display period of the previous frame and before a no-light period of the

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subsequent frame (upon the inclusion of the black adjustment data, the waveform would appear, white|black|color|hold|black adjustment. It should be clear that upon repeating the frame the limitations of the current claim are met).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

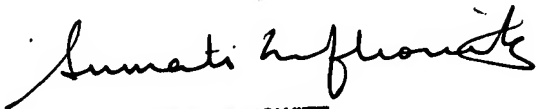
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

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Wlb
6/29/07



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SUPERVISORY PATENT EXAMINER